

WHAT IS CLAIMED IS:

1. A rotary machine utilizing magnets, wherein said magnets are inserted to be arranged radially on a rotor; and magnetic pole configurations on a rotor are provided with subsections, which are asymmetrical components, such that said subsections of said rotor reach a point at which they can react to magnetic poles of said stator not only of the same polarity but also of the opposite polarity in a relative sense.

2. A rotary machine utilizing magnets, wherein rotor magnetic poles are arranged not at a uniform pitch or angle but at various angles with a given relative displacement; magnets are inserted to be arranged radially and circularly to construct said rotor; gap or non-magnetic member portions are provided on the periphery of said magnets such that the magnetic flux generated by said circularly arranged magnets will not return to said rotor magnets directly, thereby increasing the magnetic flux density in said gap portions on said rotor and said stator.

3. A rotary machine utilizing magnets, wherein said magnets are inserted to be arranged radially on a rotor; and magnetic pole configurations on a rotor are provided with subsections, which are asymmetrical components, such that said subsections on said rotor reach a point at which they can react to electromagnetically coupled magnetic poles of said stator not only of the same polarity but also of the opposite polarity in a relative sense.

4. A rotary machine utilizing magnets wherein magnets are inserted to construct said rotor wherein the run-out component of said rotor constructed with magnets positioned in an area whose length is longer than the axial length of said stator constructed with electromagnetically coupled iron cores; the inner side defined by facing magnets, one arranged radially and the other is arranged circularly within said run-out component of said rotor having the same polarity; the inner side defined by facing magnets, one arranged radially and the other arranged circularly in a non-run out component of said rotor having the opposite polarity.

5. A rotary machine utilizing magnets, wherein
a stator comprises magnetic poles constructed with a strong magnetic member and armature windings;

permanent magnets are arranged radially and circularly on a rotor wherein the magnetic flux generated by permanent magnets arranged radially on said rotor is approximately twice as much as the magnetic flux generated by permanent magnets arranged circularly thereon;

on the rotating surface of said rotor, said grooves are formed on magnetic pole configurations made of a strong magnetic member on said rotor and the shape and width of said grooves are modified such that the magnetic flux distribution resulting from the overall interaction of each magnetic flux generated in each magnetic pole on said rotor appears substantially as a sine wave.

6. A rotary machine utilizing magnets, wherein

a stator comprises magnetic poles constructed with a strong magnetic member and armature windings;

permanent magnets are arranged radially and circularly on a rotor to control the magnetic flux generated by permanent magnets arranged radially on said rotor to be approximately twice as much as the primary magnetic flux generated by permanent magnets arranged circularly thereon;

said circularly arranged permanent magnets generating a primary magnetic flux are face to face with permanent magnets provided to generate a secondary magnetic flux;

on the rotating surface of said rotor, said grooves are formed on magnetic pole configurations made of a strong magnetic member on said rotor and a shape and width of said grooves are modified such that the magnetic flux distribution resulting from the overall interaction of each magnetic flux generated in each magnetic pole on said rotor appears substantially as a sine wave.

7. The rotary machine as defined in Claims 5 or 6 wherein on said radial permanent magnet component on said rotor, an anti-flux loss groove is provided on the rotating shaft side and said rotating shaft is made of a non-magnetic member.

8. The rotary machine as defined in any one of Claims 5, 6, and 7 wherein with respect to the intervals between each of the magnetic poles on said rotor, at a minimum the interval or pitch angle between one magnetic pole and one other magnetic pole are not equal.

9. A rotary machine utilizing magnets, wherein the iron used to construct the iron core component holding permanent magnets on said rotor is replaced with a non-magnetic member, thereby preventing magnetic flux loss between magnets and making the rotating device applicable to a large capacity.

10. A rotary machine utilizing magnets, wherein the iron used to construct the iron core component holding permanent magnets on said rotor is replaced with a non-magnetic member which is lighter than iron, thereby preventing magnetic flux loss between magnets and making the rotating device applicable to a large capacity.

11. The rotary machine as defined in Claims 9 or 10, wherein said iron used to construct the iron core component holding permanent magnets on said rotor is replaced with a conductive non-magnetic member, thereby preventing magnetic flux loss between said magnets, making the rotating device applicable to a large capacity, and providing self-starting capability.

12. A rotary machine utilizing magnets, wherein slots for attaching magnets are provided on the outer circumferential portion of an iron core component that holds radially arranged magnets on said rotor such that magnetic fields are generated radially by said magnets, thereby causing the magnetic flux of said stator and that of said rotor to react to each other to generate a torque in the rotational direction in a synchronous rotational mode.

13. The rotary machine as defined in any one of Claims 1 through 12 wherein said permanent magnets on said rotor are replaced with electromagnetic coils such as superconductive coils, thereby making the rotating device applicable to a large capacity or to transport devices such as linear motors and the like.

14. The rotary machine as defined in any one of Claims 1, 3, or 5 through 13, wherein a portion of the magnets on a radial or circular magnet component can be removed, magnetic forces of said magnets can be adjusted to modify the magnetic field of said magnetic pole components given an asymmetrical shape on said rotor, thereby further improving the properties thereof.